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## A revaluation of the systematic status of the Italian Grey Partridge *Perdix perdix* *italica* Hartert

by Carlo G. Violani, Alessandra Fedrigo and Renato Massa

Received 21 May 1987

Hartert (1917) named a new subspecies of the Grey Partridge as *Perdix perdix italica*, based on material originating from central Italy, and fixed as type a male obtained by Squilloni at Badia di Passignano, Chianti, 20 January 1905. This specimen (in fact a young male), and 13 paratypes from the Rothschild collection, are now preserved at the American Museum of Natural History, New York.

The new race was described as different "at a glance from the Central European *Perdix perdix perdix*" and so closely similar to "the Pyrenean *P. p. hispaniensis* (= *charrela*) that at first they seemed to be practically indistinguishable". However, Hartert also added that a more careful comparison showed that the Italian birds differed from *P. p. hispaniensis* thus: "the upperside less dark and distinctly more brownish; jugulum and chest not so dark grey . . . the male differs from *P. p. perdix* chiefly by the less rusty or rufous upperside, especially dark brown instead of rufous crossbars on the rump and much darker, less reddish brown spots on the upper wing coverts. The females, because of their coarser markings with the wider light shaft lines and spots, look rather different from females of *P. p. perdix*" (Hartert 1917).

According to Lovari (1975), and hence King (1978–1979), *P. p. italica* is a subspecies in danger of extinction in most of its former range (i.e. the greater part of the Italian peninsula). Its reduction in distribution and abundance in Italy was caused, according to Lovari (1975), by "hunting, changes in agricultural practice, competition from introduced Grey Partridges of other subspecies". There are, in fact, historical records of Grey Partridges being imported to northern Italy since Napoleonic times (Borsa 1924), and by 1939 at least, Scheibler (1939–1940) was suggesting the introduction of Bohemian and Hungarian Partridges in order to implement the stock of local birds in Italy.

While there is no doubt that the original populations of Italian Partridges have been greatly altered by the above factors of disturbance (Brichetti 1985, Matteucci & Toso 1985, Potts 1985, 1986, Beani 1987),

there are some doubts as to the validity of the *italica* race, which has been questioned by several subsequent authors, among them Vaurie (1965), who regarded it as "poorly differentiated from the race *hispaniensis*", and Ghigi (1958), who considered it of "doubtful systematic value" as well as all the other "local races" of *Perdix perdix*. We have therefore checked to see whether museum specimens collected in Italy no later than 1920 could support the recognition of *italica* as a distinguishable subspecies.

#### *Specimens examined*

We examined 49 adult birds labelled as *Perdix perdix italica* (skins and mounted specimens), 2 of them from the British Museum (Natural History) (BMNH), 19 from the American Museum of Natural History (AMNH), 16 from "La Specola" Museo di Zoologia dell'Universita' di Firenze (MZUF), 12 from the Museo Civico di Zoologia, Roma (MCZR), 34 of the total being ♂♂, 15 ♀♀.

We did not examine immatures and birds collected after 1920 (3 years after Hartert's original description) in order to avoid possible specimens of restocked birds or their hybrids from abroad.

We also examined other subspecies in museum material:— *P. p. perdix* (114 birds, 71 from BMNH, 12 from AMNH and 31 from the Natural History Museum of Vienna (NHMW) – 63 of which were ♂♂, 51 ♀♀); *P. p. hispaniensis* (18 birds, 9 from BMNH, 7 from AMNH, 2 from NHMW, 8 ♂♂, 10 ♀♀); *P. p. lucida* (50 birds, 21 from BMNH, 27 from AMNH, 2 from NHMW, 35 ♂♂, 15 ♀♀); *P. p. armoricana* (13 birds, 9 from BMNH, 2 from AMNH, 2 from MCZR); *P. p. sphagnetorum* (23 birds, 5 from BMNH, 4 from AMNH, 14 from the Rijksmuseum van Natuurlijke Historie (RMNH) Leiden); *P. p. robusta* (4 birds, 2 from BMNH, 2 from NHMW, 3 ♂♂, 1 ♀).

#### *Methods*

We measured exposed culmen, pressed wing, tarsus and tail lengths of all 291 specimens. We also evaluated colour intensity of crown, breast, back and rump, and compared the breast-barring texture of 163 specimens (92 ♂♂, 71 ♀♀). For the evaluation of colour intensity, we established an arbitrary scale, based on selected specimens in BMNH.

The grey intensity of crown, breast, back and rump was scored from 1 to 6 from the lightest to the darkest; a similar score was also adopted for the breast-barring texture, ranging from 1 (very fine) to 5 (very coarse) (see Table 1).

### Results

Table 2 shows the measurements of male and female *italica* compared with the nominate *perdix* and other races.

Significant differences from the nominate were found in males for the exposed culmen ( $p < 0.01$ ), tarsus ( $p < 0.005$ ) and tail ( $p < 0.01$ ) and in females for the wing ( $p < 0.005$ ) and tarsus ( $p < 0.05$ ; Student's "t" test) (Table 3). However, males' culmen and both sexes' tarsus were slightly longer and not shorter than those of nominate *perdix* as reported by Lovari (1975). A smaller value with respect to *perdix* was only found in the case of wing length for both sexes.

TABLE 1

Colour scores of reference specimens of *Perdix perdix* (see text).

		Crown	Breast	Back	Rump	Barring texture
BMNH 1965 M-2133	<i>P. p. hispaniensis</i> ♂	5	5	5	5	5
BMNH 1939-12-9-3715	<i>P. p. hispaniensis</i> ♀	5	5	5	4	5
BMNH 1949-W-6450	<i>P. p. armoricana</i> ♂	3	3	4	4	3
BMNH 1949-W-6452	<i>P. p. armoricana</i> ♀	3	4	4	5	5
BMNH 1938-2-5-2	<i>P. p. sphagnetorum</i> ♂	4	3	4	5	3
BMNH 1949-W-6441	<i>P. p. sphagnetorum</i> ♀	5	4	5	5	3
BMNH no number	<i>P. p. perdix</i> ♂	3	2	3	3	3
BMNH no number	<i>P. p. perdix</i> ♀	4	2	3	3	3
BMNH 92-12-24-5	<i>P. p. lucida</i> ♂	1	1	2	1	2
BMNH 1965-M-2151	<i>P. p. lucida</i> ♀	3	3	2	1	2
BMNH 1965-M-2125	<i>P. p. robusta</i> ♂	1	1	1	1	2
BMNH 1965-M-2124	<i>P. p. robusta</i> ♀	3	2	1	2	3
MZUF M4637 C1050	<i>P. p. italica</i> ♂	2	3	3	4	4
AMNH 541842 (Paratype)	<i>P. p. italica</i> ♀	2	2	3	2	4

TABLE 2

Biometric measurements of male and female specimens of Grey Partridge *Perdix perdix* subspecies (mm); N=number of specimens examined.

MALES		Wing	N	Tail	N	Culmen	N	Tarsus	N
<i>Perdix</i>	154.9±0.663	62	82.4±0.481	62	15.1±0.103	63	41.0±0.335	63	
<i>italica</i>	153.0±0.685	34	80.1±0.750	33	15.6±0.185	33	42.1±0.526	34	
<i>lucida</i>	160.6±0.805	35	82.8±0.434	35	15.3±0.114	35	40.3±0.379	35	
<i>hispaniensis</i>	152.5±1.512	8	82.6±1.362	8	15.2±0.247	8	39.5±0.495	8	
<i>armoricana</i>	154.7±1.145	8	82.0±0.823	8	14.8±0.121	8	40.0±0.802	8	
<i>sphagnetorum</i>	154.4±0.994	11	83.0±0.588	11	14.3±0.244	10	41.2±0.672	11	
<i>robusta</i>	161.0±0.577	3	85.5±2.333	3	15.5±0.500	2	40.0±1.155	3	
FEMALES									
<i>Perdix</i>	153.5±0.558	51	81.3±0.655	51	15.1±0.131	50	40.6±0.268	51	
<i>italica</i>	149.3±1.258	15	79.5±1.112	15	15.3±0.164	50	42.2±0.907	51	
<i>lucida</i>	156.7±1.422	15	81.3±0.643	15	15.7±0.124	15	40.3±0.772	15	
<i>hispaniensis</i>	147.6±3.344	10	84.1±2.368	10	14.8±0.367	10	39.6±0.367	10	
<i>armoricana</i>	150.0±2.258	5	81.4±1.208	5	15.2±0.211	5	42.6±1.122	5	
<i>sphagnetorum</i>	150.9±0.633	12	80.1±0.543	12	14.9±0.243	12	39.0±0.408	12	
<i>robusta</i>	—	1	—	1	—	1	—	1	

Table 3(a,b) shows also significant differences in body measurements between either *P. p. perdix* (a) or *P. p. italica* (b) and 5 different subspecies (*italica*, *lucida*, *hispaniensis*, *armoricana*, *sphagnetorum*). There is little mensural difference between *italica* and *hispaniensis* (only tarsus length), but no difference at all between *hispaniensis* and *perdix*.

The tarsus and culmen measurements of the male holotype of *P. p. italica* (AMNH 541843 – tarsus 40 mm, culmen 15.0 mm) were smaller and not even comparable with the mean values (95% confidence interval) of all the specimens of *italica* measured by us (Table 4). The holotype's culmen was included in the 95% confidence interval of the mean value of *P. p. perdix*, but the wing (155 mm) and the tail (84 mm) of the holotype

TABLE 3

Significance of comparison of measurements and colour intensities between *P.p. perdix* and *P.p. italica* and other subspecies. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ ; \*\*\* =  $p < 0.001$ ; ns = not significant. (a) *P.p. perdix* vs others; (b) *P.p. italica* vs others.

(a) <i>P. p. perdix</i>	Biometry									Colour									(a) <i>P. p. italica</i>	Biometry									Colour								
	wing	tail	culmen	tarsus	crowns	* breast	back	rump	b. texture	wing	tail	culmen	tarsus	crowns	breast	back	rump	b. texture		wing	tail	culmen	tarsus	crowns	breast	back	rump	b. texture									
MALES																			MALES																		
<i>italica</i>	ns	**	**	**	ns	ns	ns	**	**										<i>perdix</i>	ns	**	**	**	ns	ns	ns	**	**									
<i>lucida</i>	***	ns	ns	ns	ns	ns	**	ns	**										<i>lucida</i>	***	**	ns	***	ns	**	ns	ns	**									
<i>hispaniensis</i>	ns	ns	ns	ns	***	***	***	***	***										<i>hispaniensis</i>	ns	ns	ns	**	***	***	***	***	***									
<i>armoricana</i>	ns	ns	ns	ns	*	ns	*	*	ns										<i>armoricana</i>	ns	ns	*	*	***	ns	**	*	ns									
<i>sphagnetorum</i>	ns	ns	**	ns	***	***	***	***	***										<i>sphagnetorum</i>	ns	*	**	ns	***	***	***	***	***									
FEMALES																			FEMALES																		
<i>italica</i>	**	ns	ns	*	ns	ns	ns	ns	***										<i>perdix</i>	**	ns	ns	*	ns	ns	ns	ns	***									
<i>lucida</i>	*	ns	*	ns	ns	ns	*	ns	ns										<i>lucida</i>	***	ns	ns	ns	ns	ns	ns	ns	*									
<i>hispaniensis</i>	**	ns	ns	ns	***	***	***	***	***										<i>hispaniensis</i>	ns	ns	ns	*	**	**	**	**	***									
<i>armoricana</i>	ns	ns	ns	*	ns	***	**	***	***										<i>armoricana</i>	ns	ns	ns	ns	ns	ns	*	***	ns									
<i>sphagnetorum</i>	*	ns	ns	**	***	***	***	***	ns										<i>sphagnetorum</i>	ns	ns	ns	**	***	***	***	***	***									

TABLE 4

Mean and limits (upper and lower) of 95% confidence interval for biometric parameters (mm) in *P. p. italica* and in *P. p. perdix*. Holotype measurements in the first column.

	Holotype <i>P. p. italica</i>	<i>P. p. italica</i>		<i>P. p. perdix</i>	
		Mean	Limits	Mean	Limits
Wing	155	153.0	151.6 154.4	154.9	153.6 155.2
Tail	84	80.1	78.6 81.6	82.4	81.4 83.4
Culmen	15	15.6	15.2 16.0	15.1	14.9 15.3
Tarsus	40	42.9	41.9 43.9	41.0	40.3 41.7

were larger than the mean values of *italica* and not included in the 95% confidence intervals. On the other hand, the wing was fully comparable (included in the 95% confidence interval) to that of *P. p. perdix*.

Colour intensities of *italica* and nominate *perdix* are shown in Table 5. No significant difference (Table 3) was found in the colour intensity between *italica* and *perdix* except in the case of the male rump, which was slightly lighter (and not darker) in *italica* ( $p < 0.01$ ). In both sexes the breast-barring texture was coarser in *italica* than in *perdix* ( $p < 0.01$ ; Student's "t" test).

When colour intensities of *italica* and *perdix* are compared with those of *hispaniensis*, *armoricana* and *sphagnetorum* (Table 3), it appears that the 3 latter are the most distinctive forms, being much darker ( $p < 0.0005$ ; Student's "t" test, for both sexes and almost all scores) than both *italica* and *perdix*, though Table 5 cannot show the tone of the colour, i.e. dark rufous for *armoricana* and dark grey for *hispaniensis* and *sphagnetorum*.

TABLE 5

Colour scores of specimens of Grey Partridge *Perdix perdix* belonging to different subspecies (see text).

♂♂	Crown	Breast	Back	Rump	Barring tex.	N
<i>perdix</i>	2.15±0.1401	2.96±0.0911	2.97±0.0936	2.85±0.1009	2.51±0.1596	39
<i>italica</i>	1.89±0.0762	2.67±0.1617	2.89±0.0762	2.11±0.2542	3.28±0.1354	18
<i>lucida</i>	1.92±0.1486	2.50±0.2303	2.42±0.1486	2.25±0.2176	2.67±0.2247	12
<i>hispaniensis</i>	5.00±0.0000	5.00±0.0000	5.00±0.0000	5.00±0.0000	5.00±0.0000	6
<i>armoricana</i>	3.00±0.2582	3.33±0.2108	3.17±0.4014	3.67±0.2108	2.83±0.1667	6
<i>sphagnetorum</i>	5.40±0.3055	5.40±0.3555	5.40±0.2211	5.30±0.3000	1.50±0.3073	10
♀♀						
<i>perdix</i>	2.78±0.1781	2.75±0.1100	2.81±0.1139	3.09±0.1132	2.75±0.1188	32
<i>italica</i>	2.83±0.3658	2.33±0.2562	3.27±0.2727	2.58±0.3362	2.33±0.2562	12
<i>lucida</i>	2.89±0.3889	2.78±0.2222	2.56±0.1757	2.44±0.2422	3.11±0.3514	9
<i>hispaniensis</i>	5.00±0.0000	4.67±0.3333	4.67±0.3333	4.67±0.3333	5.00±0.0000	3
<i>armoricana</i>	3.20±0.4899	4.20±0.2000	4.20±0.3742	4.20±0.3742	3.80±0.5831	5
<i>sphagnetorum</i>	5.11±0.1111	4.11±0.2606	5.11±0.1111	5.11±0.1111	2.56±0.1757	9

These comparisons show that *italica* is in fact much more similar to *perdix* and *lucida* than it is to *hispaniensis* as originally asserted by Hartert (1917).

Concerning the biometric measurements shown in Table 2 and their statistical significance in Table 3, it appears that in males there are no significant differences except in the case of *perdix* vs *hispaniensis* and *perdix* vs *armoricana*, and in females except in the case of *italica* vs *armoricana*.

### Discussion

The main finding of this investigation, as far as biometrics are concerned, is that the holotype on which Hartert based his description of *P. p. italica* is in fact very similar to *P. p. perdix*.

Moreover, the colours, when scored on a semi-quantitative basis, appeared only slightly different when *perdix* and *italica* are compared, but very different when both subspecies are compared to *hispaniensis*, *armoricana* and *sphagnetorum*, all of which are definitely darker.

Therefore, apart from any evaluation of the systematic value on purely morphological criteria, it appears that the original description of *P. p. italica* is not based on objective, constant differences either in biometry or in colour. For these reasons we propose to put this subspecies in synonymy with *P. p. perdix*.

### Acknowledgements

We are indebted to the scientific staff of the following museums for kindly granting access to the ornithological collections in their care and for lending us some valuable specimens: BM(NH) Tring, England; Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands; AMNH, New York, USA; Museo Zoologico dell'Università 'La Specola', Firenze, Italy; Museo Civico di Zoologia, Roma, Italy; Naturhistorisches Museum, Vienna, Austria. We are also grateful to the Federazione Italiana della Caccia, Roma, who provided C.V. and R.M. with a travel grant to Great Britain. Special thanks are due to Michael R. W. Rands and Nigel J. Collar (ICBP, Cambridge), for their helpful suggestions and to Alberto Meriggi (Dipartimento di Biologia Animale, Università di Pavia, Italy) for useful discussions.

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## APPENDIX

Localities and year of collecting (up to 1920) of examined specimens of *Perdix p. italica*.  
*Piedmont*: (province of Torino) Piosasco 1882; (prov. Alessandria) Voltaggio 1889.  
*Veneto*: (prov. Verona) Villafranca 1899 & 1900, Costa San Massimo 1908, Pescantina 1906; (prov. Vicenza) near Bassano 1897; (prov. Padova) near Padova 1884, Colli Euganei 1878 & 1897. *Friuli*: (prov. Udine) Udine 1899. *Emilia Romagna*: (prov. Reggio Emilia) Reggio Emilia 1920. *Tuscany*: (prov. Firenze) Firenze 1881 & 1897, Castelfalfi 1877, Fiesole 1875, Mugello 1905, Vicchio di Mugello 1903, Barberino di Mugello 1881, Empoli 1878, M. Calvana Prato 1877, Prato 1884, Collegalli 1863 & 1864, Greve 1900, Badia di Passignano in Chianti 1905 [**type locality**]; (prov. Pisa) Laiatice 1881, Saline di Volterra 1878, S. Donnino Volterra 1882, Pontedera 1877, Spedaletto 1868 & 1870, Pallaia S. Miniato 1877; (prov. Arezzo) Fabbriche 1904, Lucignano 1876, Gargonza 1910, Montevarchi 1893; (prov. Grosseto) Grosseto 1883, Maremma 1879; (prov. Siena) Radda in Chianti 1876, Amiata 1903, Meleto 1880, 1883 & 1908. *Umbria*: (prov. Perugia) Foligno 1880; (prov. Terni) Terni 1881, Orvieto 1896. *Latium*: (prov. Roma) Roma 1902, Tor Paterno' 1901. *Campania*: (prov. Napoli) Napoli pre-1904.

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## Nest and eggs of the Angola Lark *Mirafra angolensis*

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Received 9 June 1987

According to Mackworth-Praed & Grant (1962) the nest and eggs of the Angola Lark *Mirafra angolensis* are "apparently undescribed". On 17 October 1986 I flushed a tight-sitting lark from its nest containing 3 eggs.